REMARKS

Cynamon et al.

In the aforementioned Notice of Action, Claims 1-3, and 8 to 24 were rejected under 35 U.S.C. 102(b) as being anticipated by Cynamon et al. (US 2,485,434). To better distinguish the claims over the cited reference, independent claim 1 has been amended to incorporate additional limitations and a new independent claim 26 has been added.

Previously, dependent claim 9 described the anti-roll device as being mounted to "at least one end of the leaf springs". The Examiner has asserted that as the location of bar 10 of Cynamon et al. is not located at the middle of the springs, it would be reasonable to interpret the bar as being located at one of the ends of the spring. Independent claim 1 has been amended to include the limitation that the ends of the anti-roll device are "each mounted rigidly to the respective one of the opposed leaf springs at a position therealong nearer to where the respective one of the opposed leaf springs mounts to the vehicle chassis than to where the respective one of the opposed leaf springs connects to the vehicle axle". This is supported by the originally filed specification and drawings where the anti-roll device, presented as rigid member 12 in the detailed embodiment, is described and illustrated as having "its respective opposed ends mounted rigidly to the corresponding ends of the pair of leaf springs 1" (specification page 18, lines 17-20; Fig. 9). Cynamon et al. fails to teach this newly added limitation, as the bar 10 asserted by the Examiner to correspond to the presently claimed anti-roll device is clearly positioned in much closer proximity to the connection of the springs and the vehicle axle than to the connection of the springs and vehicle chassis.

As outlined in section 2131 of the MPEP, a reference must teach each and every element of a claim in order to anticipate a reference under 35 U.S.C. 102(b), and therefore Cynamon et al. fails to anticipate amended independent claim 1. Furthermore,

a person of skill in the art would not be motivated to modify Cynamon et al. to reposition the bar 10 into "a position therealong nearer to where the leaf springs connect to the vehicle chassis than to where the leaf springs connect to the vehicle axle", as this would render the prior art unsatisfactory for its intended purpose. In the paragraph spanning lines 8 to 21 of column 1, Cynamon et al. states that "It is well-known fact that the forwardly extending portion of rear end housings is caused to move upwardly or downwardly in response to suddenly increased or decreased torque in the transmission shaft", that "This upward or downward movement is wholly undesirable since it weakens the entire transmission structure and mechanism", and that "The present invention comprises means for eliminating or at least greatly reducing such upward and downward movement", hence the positioning of the stabilizing bar 10 so as to be "connected to the forward end 12 of the rear end housing 13" as described in the paragraph bridging columns 1 and 2 of the reference and as illustrated in Figure 1 thereof. To reposition the bar 10 of Cynamon et al. to a position nearer the chassis-mounted ends of the springs 17 than to the axle carrying the rear end housing 13 would entirely contradict the explicitly stated purpose of Cynamon et al.'s bar and thus render the bar unsuitable for its intended purpose. As outlined in section 2143.01V of the MPEP, where the modification would render the prior art invention unsuitable for its intended purpose, there is no motivation to make the modification.

Previously, dependent claim 10 described the anti-roll device as having its opposed ends "offset from the neutral plane in bending of each of the opposed leaf springs by means of spacers". The Examiner has asserted that the compression springs 20 locked in place by nuts 21 atop the bar 10 on the U-bolts 18 connecting the bar 10 to the leaf springs 17 "take up space and act as washers and are therefore interpreted as spacers". Dependent claim 10 has been amended to now describe the claimed spacers as "disposed between the anti-roll device and the opposed leaf springs". As is readily

apparent from Figure 2 of Cynamon et al., the compression springs 20 are not positioned between the bar 10 and the leaf springs 17, but rather are situated on the top side of the bar 10 opposite the leaf springs 17 situated beneath the bar 10. Therefore, even when interpreted as spacers, the compression springs 20 fail to read on the now claimed limitation of "spacers disposed between the anti-roll device and the opposed leaf springs".

Cynamon et al. thus fails to anticipate claim 10, not only for failing to disclose all elements of claim 1 on which it depends, but also for failing to disclose the positioning of the claimed spacers relative to the leaf springs and the anti-roll device. Furthermore, there is no motivation to modify the teachings of Cynamon et al. to reposition the compression springs 20 between the leaf springs 17 and the bar 10, as the U-bolts 18 on which the compression springs 20 are mounted to accomplish their intended function of providing a resilient connection between the ends of the stabilizing bar 10 and the leaf springs 17 (column 2, lines 9-17) do not accommodate such a position.

In view of the forgoing, it is respectfully submitted that claim 1 and claims 2, 10, 11, 19, 20 and 23 to 25 dependent thereon are now patentably distinguished over Cynamon et al. These claims have been amended to remove use of the term "mounting means", make minor language changes, make one dependency adjustment in view of cancellation of the other previously presented claims, and add new claim 25 describing clamping mounts embracing the springs as described in the first two paragraphs on page 21 of the specification.

Furthermore, the Examiner, in the second paragraph of page 2, item 2 of the aforementioned office action, asserts that the bar 10 in Cynamon is an anti-roll device. It is respectfully submitted that this would be considered absolutely wrong and incorrect by a person skilled in suspension technology and familiar with the suspension industry. Cynamon et al. is accurate by never referring to the system taught therein as an anti-roll

stabilizer. An anti-roll system/device/stabilizer/etc. is a system that stiffens the suspension only during vehicle or suspension roll deflection, and not in normal ride deflection, which corresponds to straight up and down movement of the axle. During vehicle roll, the springs on opposite sides deflect in different directions, whilst under normal ride, and wind-up, such as that experienced during braking and traction, the springs deflect in the same direction. To help those not fully versed in this technology, and to try to avoid confusion, the present application defines anti-roll mechanisms as those which "resist vehicle roll, without increasing the vertical spring stiffness, when both vehicle wheels deflect together" (page 2, lines 29-31 and page 3, lines 1-5), corresponding to what people versed in suspension technology would understand as an anti-roll device.

The device called a stabilizer in Cynamon et al. is never called an anti-roll device, but instead stabilizes the springs during axle wind up and generally stiffens the springs and total suspension. As discussed in the present application (circa page 2, lines 11-14) stiffening the spring will reduce vehicle roll, but, it also reduces the quality of ride and general isolation. An anti-roll device, as defined in this industry, by people versed in this technology, allows the springs and suspension to be softened to improve ride, but then the anti-roll system/device stiffens the suspension ONLY during vehicle roll. On the other hand, the term stabilizer or stabilizer bar can generally refer to any bar that stiffens or braces anything such as a bracket, or in this particular context a total suspension. To be specified correctly applied to stabilizing roll, a stabilizer bar needs to be referred to as an anti-roll stabilizer bar, device or system.

The device in Cynamon et al. is clamped to the spring to create a vertical force onto each spring leaf to resist deflection of that leaf. The "regulated tension", "tension", and "spring tension" referred to in Cynamon et al.'s claims 3,4 and 5 and provided by the compression springs 20 need to be sufficient to hold the device onto the leaf springs up to a required vertical force. This clamp force should be kept to a minimum

to avoid high, ride spoiling friction and wear damage to the springs. The resilience in the clamping of the bar 10 to the leaf springs 17 allows all the spring leaves to move horizontally so that the leaf springs can function. A person versed in spring technology would readily appreciate that if this clamping were rigid enough to stop the leaf spring moving within the clamp, then the leaf spring would cease to function as a spring completely. The leaf spring would instead act as a rigid beam with negligible deflection, which besides being illegal on the road, in this type of vehicle in some countries, the resulting suspension-less vehicle would have a dreadful and unsatisfactory ride and general vehicle durability. The spring leaves have to move relative to each other to function as a spring and the upper leaf would also have to move relative to the stabilizer because the stabilizer is horizontally spaced from the axle being carried on the spring. Therefore, the clamping of the bar 10 of Cynamon et al. around the full leaf spring stack at a position in close proximity to the axle would render the vehicle's suspension useless if made rigid.

New claim 26 has been added, in which the opposed ends of anti-roll device are indicated as being mounted "as close as is practically possible to where the springs connect to the vehicle chassis" and "so rigidly that that there is no relative movement of the opposed ends of the anti-roll device to respective ones of the pair of opposed leaf springs, such that during spring deflection, when the springs deflect in different directions to each other, the springs change from pin-jointed characteristic beams toward fixed ended characteristic beams at the equivalent ends, and when the springs deflect in the same direction, the springs stay as pin-jointed characteristic beams". Support for this in the original specification is found on page 12, lines 8-26. The new independent claim also describes the mounting of the anti-roll device to the springs as being "at a substantial offset distance from a neutral axis in bending of the springs, by rigid mounts sufficient to make the transverse anti-roll device into a double fixed ended

characteristic beam in plan view, resisting the spring deflection when the springs deflect in opposite directions such that resistance forces combined with the offset distance from the neutral axis creates moments in the springs to further change spring bending characteristics from pin-jointed to fixed ended beam characteristics when the springs deflect in different, opposing directions during vehicle roll. Additional support for this limitation is found in the original specification on page 19, lines 1-31.

Cynamon et al. clearly does not teach or suggest mounting of its bar 10 "rigidly", "as close as is practically possible to where the springs connect to the vehicle chassis", and "at a substantial offset distance from a neutral axis in bending of the springs, by rigid mounts" to change the leaf springs "from pin-jointed characteristic beams toward fixed ended characteristic beams" when the springs deflect in opposite directions during vehicle roll. New claim 28, depending on new claim 26, indicates the use of "rigid and solid spacers" for offsetting of the anti-roll device from the spring's neutral axis in bending. In addition to the above-described inutility of Cynamon et al.'s suspension system if the connections between the bar 10 and leaf springs 17 are rigid, the Examiner's position that the compression springs 20 of Cynamon et al. both define spacers and provide a rigid connection is also respectfully opposed because a person of skill in the art would appreciate that Cynamon et al. would not teach the use of costly high-strength coil springs in place of a more affordable spacer of solid and rigid construction if the two elements yielded the same result. In other words, a person of skill in the art would understand the compression spring, described as resilient in Cynamon et al., to be a compressible element that is resistive to, but not incapable of, compression in the context of its particular use in the prior art reference, as it would seem unreasonable and illogical to the skilled person for the prior art inventors to have chosen a spring to act as a rigid spacer or washer.

New dependent claim 27 describes the rigid mounting of the anti-roll device as preventing movement relative to at least one leaf of each leaf spring, as the original specification provides for use of the anti-roll device on leaf spring stacks of multiple leaves (page 1, paragraph 1). Except for its dependency, new dependent claim 29 is a carbon copy of claim 28 described in the preceding paragraph. New dependent claim 30 describes the anti-roll device as a fixed ended beam structure when viewed in plan, as supported in the original specification in the paragraph bridging pages 7 and 8. Except for their dependencies, new dependent claims 31-33 are carbon copies of claim 30. New dependent claim 34 adds the use of U-bolts in mounting of the anti-roll device to the leaf springs and new dependent claim 35 is a copy of claim previously presented claim 19, but dependent on new independent claim 26. New dependent claim 36 describes clamping mounts embracing the springs as described in the first two paragraphs on page 21 of the specification.

Other Prior Art

Suh (U.S. Patent No. 6,428,025)

Suh's suspension system does appear to change the beam characteristic of the leaf spring from its normally pin-jointed beam characteristic toward a fixed ended beam characteristic at certain times during use, but this effect is not achieved using a transverse member, like a tube or bar, extending between the leaf springs on opposite sides of the vehicle. Instead it appears that Suh changes the beam characteristic by locking the bush or spring pin 4 after a predetermined amount of rotation due to cooperating stops formed at an end the spring pin 4 and the bracket 3 on the vehicle frame receiving this end of the pin.

An eye bush or bearing has to be able to rotate to operate normally. Suh indicates in column 2, lines 61 to 64 that when the vehicle is running, the suspension

system of the present invention operates in the same manner as the conventional system, but it is not clear how this is possible. The spring eye 2a with serrations 2b is locked to the pin 4 with corresponding serrations 4a. In Suh's system, shown assembled in Fig 2, it appears that the pin 4 should not rotate in the bracket 3. However, assuming an additional unillustrated bearing was located between the frame bracket 3 and the pin 4 at the point where the arrow of reference character 4 contacts the pin in Figure 3, then the pin would rotate until the hitching edge 4b of the pin 4 locks up against the stopper 3b of the bracket 3. This would then stiffen the spring by changing from a pin jointed beam characteristic to a fixed ended beam characteristic. However, unlike the present invention, it appears that Suh's system would achieve this lock-up not only when the springs deflect in opposite directions during vehicle roll, but also when the springs rotate together, in the same direction, as experienced in normal ride. Therefore, Suh's system does not appear to be an anti-roll system, but rather a system that stiffens the springs during any deflection experienced beyond a set amount of deflection.

Suh therefore fails to anticipate the present claims, as it fails to teach an "anti-roll device which is arranged to extend transversally of the vehicle chassis" and connected to leaf springs on respective opposed sides thereof, as indicated in each present independent claim. Furthermore, there is no motivation to somehow combine Suh's teachings with other references that do feature such a transverse member to obtain the subject matter of independent claim 26, as Suh does not explain how to achieve a system in which "during spring deflection, when the springs deflect in different directions to each other, the springs change from pin-jointed characteristic beams toward fixed ended characteristic beams at the equivalent ends, and when the springs deflect in the same direction, the springs stay as pin-jointed characteristic beams", because as explained above, the system of Suh appears to induce a change in a leaf spring's beam characteristic after undergoing a predetermined amount deflection, regardless of whether

the deflection is in the same or opposite direction as the opposite leaf spring on the other side of the vehicle chassis. Furthermore, even if the teachings of Suh are construed to somehow only lock up the spring eye during vehicle roll, there is nothing in Suh to suggest that the same effect can be attained by a rigid mounting of ends of a transverse member adjacent a mounting end of the leaf springs.

Aubry et al. (U.S. Patent No. 4,621,834)

Aubry et al.'s system uses a transverse tube to change the spring beam bending characteristic from pin-ended during normal ride, to fixed-ended during roll (i.e. normal ride, when springs deflect in the same direction, and roll, when they deflect in the opposite direction). This prior art differs from the present invention because the bushes or bearings 5 connecting the suspension system to the vehicle at the tranverse tube end of the system are mounted on the transverse tube 4. This clearly fails to anticipate claim 1, specifically the passage therein that describes "each of the opposed ends of the anti-roll device being mounted rigidly to the respective one of the opposed leaf springs at a position therealong nearer to where the respective one of the opposed leaf springs mounts to the vehicle chassis," and thereby explicitly indicates that it is the leaf springs that are mounted to the vehicle chassis, not the anti-roll device, at the end of the suspension system at which the anti-roll device is installed.

Also, Aubry et al.'s elastic blades 7, the elements most closely corresponding to the presently claimed leaf springs, have their eyes 14 closing around respective ends of the tube 4. As shown in Figures 2 and 4, the eye 14 of each elastic blade 7 lies on the central plane or axis, in bending, of the blade and so there is no offset of the tube to the neutral axis of bending of the blade or spring to create the extra fixed ended moment therein. The reference therefore fails to anticipate independent claim 26, where the anti-roll device is "mounted to the respective springs at a substantial offset

distance from a neutral axis in bending of the springs, by rigid mounts sufficient to make the transverse anti-roll device into a double fixed ended characteristic beam in plan view, resisting the spring deflection when the springs deflect in opposite directions such that resistance forces combined with the offset distance from the neutral axis creates moments in the springs to further change spring bending characteristics from pin-jointed to fixed ended beam characteristics when the springs deflect in different, opposing directions during vehicle roll."

A person of skill in the art would not be motivated to modify Aubry et al.'s system to apply such an offset of the transverse tube due to Aubry's et al.'s teaching of the transverse tube being positioned at the connection at the eye of the spring or blade and the connection of the system to the vehicle chassis. This teaching would result in any offset of the transverse tube relative to the axis of the spring resulting in the eye of the spring also being so offset. Assuming that Aubry et al.'s transverse tube is not infinitely rigid in torsion, as suggested by the use of the term "torsion bar" to describe it, any twisting thereof during roll or one wheel bump, with substantial offset of the spring/tube/chassis connection from the axis of the blade or spring in bending, would create axle steer - an additional roll steer effect. Also, any impact at the wheel/ground contact creating fore and aft forces down the spring could create additional axle steer. This bump steer effect can cause heavy axle tramp, especially where the unsprung mass, bouncing on the tires, is close to the sprung mass. Also, the substantial offset of the location of the effective spring eye from the spring axis would, during braking and under traction, create undesirable bending moments down the leaves creating extra wind-up.

The modification of Aubry et al. necessary to achieve the offset of the anti-roll device from the spring axis in independent claim 26 would thus increase roll steer effects and axle wind-up, thereby directly contradicting the intended purpose of Aubry et al.'s system, outlined in column 1, lines 21-24 in the indication that "Said torsion bar

associated with the blades thus performs the function of anti-roll and the longitudinal efforts (traction and braking) are transmitted from the wheels to the chassis by theblades and said torsion bar". As outlined in section 2143.01V of the MPEP, where the modification would render the prior art invention unsuitable for its intended purpose, there is no motivation to make the modification.

Also in Aubrey et al.'s system, application of the resistant force by the anti-roll device as described in present claim 26 would be transmitted straight into the vehicle, not the blade or spring, due to the mounting Aubry et al.'s system to the vehicle chassis on the transverse tube, not the spring. Aubry et al. thus fails to teach the claim 26 limitation of "rigid mounts sufficient to make the transverse anti-roll device into a double fixed ended characteristic beam in plan view, resisting the spring deflection when the springs deflect in opposite directions such that resistance forces combined with the offset distance from the neutral axis creates moments in the springs", thereby failing to meet the requirements of section 2131 of the MPEP for a proper showing of anticipation.

In view of the foregoing, it is believed that the claims of the present application are patentably distinguished from the prior art, and therefore should be found allowable. Further and more favorable consideration is requested.

Respectfully submitted

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